Findings And Policies

ENERGY

Proposed Amendments

DRAFT

CRMC

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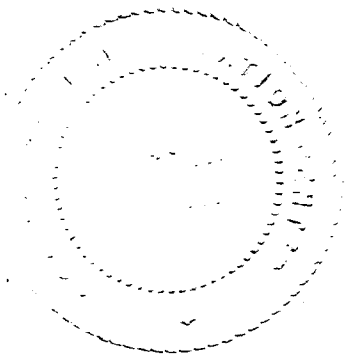

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL
83 Park Street
Providence, R.I. 02903

July 14, 1978

Dear Friend

This draft marks the last major step in the long process of developing a comprehensive and long range Coastal Management Program for the State of Rhode Island. In September 1977, after many months of workshops and hearings, a 350-page document entitled *The State of Rhode Island Coastal Management Program* was adopted by the Coastal Resources Management Council (CRMC) and subsequently became state law. In May 1978 the same document was approved under the requirements of the federal Coastal Zone Management Act and the state received a one million dollar grant to help it implement the Program.

The Program adopted in 1977 and approved in 1978 contains interim Findings, Policies and Regulations on Energy (Chapter 6). The existing document sets forth (Section 610) how the state shall expand and revise these sections by September 30, 1978. This draft constitutes those revisions and would replace:

Section 610, Planning for Energy Facilities; Findings, Policies and Regulations;

Section 620.0-2, Electrical Power Production; Policies and Regulations;

Section 640.1-2 and 640.2-2, Storage of Petroleum Products; Policies and Regulations;

Section 650.0-2, Processing of Petroleum Products; Policies and Regulations.

Findings on all but the first of the above sections will remain intact and both Finding and Regulatory Policies on the Transfer of Petroleum Products (Section 630) will be unchanged.

Section 240, Native Energy Resources, has also been updated and expanded and is attached.

The proposed amendments to Chapter 6 are designed to meet the 1976 energy facility planning requirements (Section 305(b)(8)) of the federal Coastal Zone Management Act and constitute an important and needed refinement to our state's Coastal Program.

The proposed amendments are being circulated in draft form. They will be discussed at informal workshops and will be further refined before a final, corrected draft is drawn up in early August. A formal hearing on the corrected draft will be scheduled for early September. The hearing will offer another opportunity to all interested parties to comment. We urge you, however, to inform us of your comments as soon as possible, either at the workshops or soon thereafter.

The workshops have been scheduled as follows:

July 18, 7:30 pm	July 19, 7:30 pm	July 20, 7:30 pm
Room 313	Norman D. Watkins	City Council Chambers
State House	Auditorium	City Hall
Providence	URI, Bay Campus	Newport
	Narragansett	

I look forward to hearing from you on this important addition to our Coastal Program.

Sincerely

John A Lyons

John A. Lyons, Chairman
COASTAL RESOURCES MANAGEMENT COUNCIL

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Attachments

1978 -- DRAFT ENERGY FINDINGS

I. The Council finds the following underlying considerations to be crucial to the development of a responsible energy facility siting policy:

A. The availability of energy resources, particularly petroleum, upon which the State of Rhode Island presently depends is highly sensitive to numerous external factors and trends including many that are global in scope.

B. These same factors and trends will continue to affect energy resource availability in Rhode Island in the forseeable future, and are likely to bring a decrease in the available supply and an increase in the end cost of petroleum - the energy source on which this state is most dependent.

C. Many, if not most, of these external factors and trends are beyond the state's ability to influence or control, and they thereby impose numerous and severe constraints on the options available to the state to assure that its energy needs are met.

D. Given all of the above, uncertainty as to the availability and costs of traditional energy sources will be the central issue affecting Rhode Island's energy future. The ability to come to grips with and accomodate this uncertainty without severe social and economic disruptions will be the single most important measurement of the success or failure of this state's energy plans, policies and programs.

II. The most influential trend affecting the availability of energy resources for Rhode Island consumption is the growing competition for non-renewable energy sources and supplies. Increased competition is a global phenomenon, is growing in momentum and will have wide ranging international, domestic, and regional implications. The scope and complexity of this problem have been explored in a variety of responsible sources including the Central Intelligence Agency's Report on the International Energy Situation - 1985, World Energy Outlook; an Exxon Background Study of April, 1978; Energy: Global Prospects 1985-2000, a product of the Workshop on Alternative Energy Strategies and Geopolitics of Energy, a report to the United States Senate Committee on Interior and Insular Affairs.

These and other studies all point to the same driving forces in a developing world energy crisis.

A. World population is expanding exponentially from 1.7 billion at the turn of this century to a projected 6-7 billion by the year 2000. A growing population brings increased demand and competition for finite supplies of non-renewable energy resources (Figure 1)

B. As developed countries continue to grow and less developed nations struggle to modernize and expand their economies, per capita energy consumption increases. In the United States, the per capita energy consumption rose 250 percent between 1900 and 1975; this accompanied a 280 percent increase in population and a 950 percent rise in the Gross National Product (GNP).

C. The combination of worldwide trends of increasing population and economic development are of particular concern to heavy energy consumers such as the United States where maintenance of a high "standard of living" has historically been associated with high energy consumption.

D. With its ever growing dependence on foreign oil imports, (see Figure 2) the United States is becoming increasingly vulnerable to energy related economic disruptions over which it has little direct control -witness the 1973 Arab oil embargo. Even absent of such disruptions, increasing oil imports have created a severe dollar drain that contributes to domestic inflation. As more and more bidders enter the market for foreign oil, the United States position becomes increasingly precarious.

E. The availability of other energy resources which now fuel the United States economy is also threatened by growing dependence on foreign sources and increased competition in the international market. Eighty-six percent of the world's known reserves of oil, 86 percent of its natural gas, 81 percent of its coal, and 77 percent of its uranium are located outside United States borders.

III. While untapped domestic supplies of energy resources remain, Rhode Islanders should not expect that exploitation of these resources will provide any short term, low cost or reliable solutions to our energy needs. We remain at the end of most supply routes and will continue to pay the penalties this position entails.

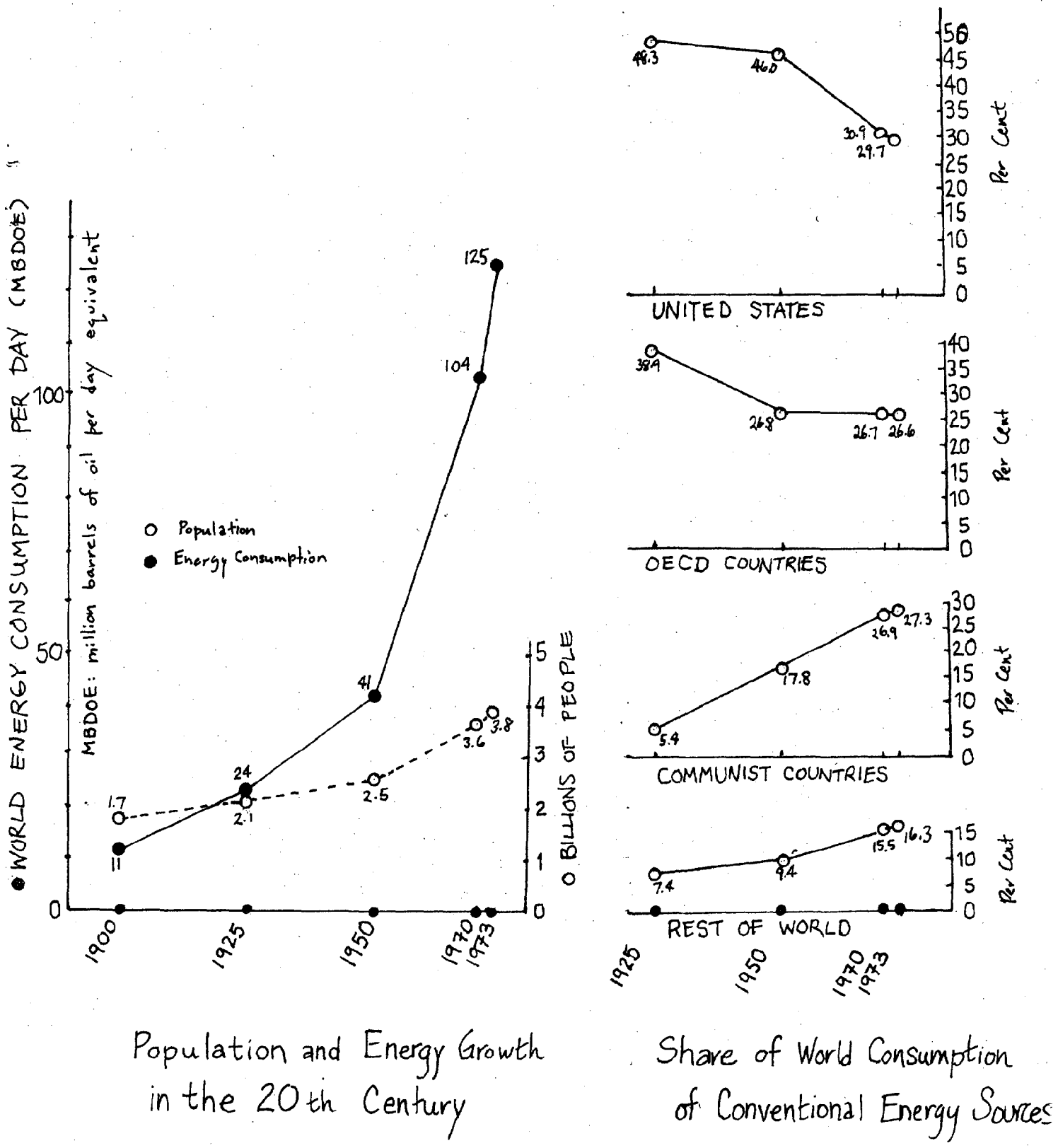

Figure 1 World Population Growth and Consumption of Energy Resources

Sources: Harry Perry and Hans Landsberg,"Projected World Energy Consumption", Resources for the Future,Inc.; Bureau of the Census,Department of Commerce, The Statistical Abstract of the U.S., 1977.

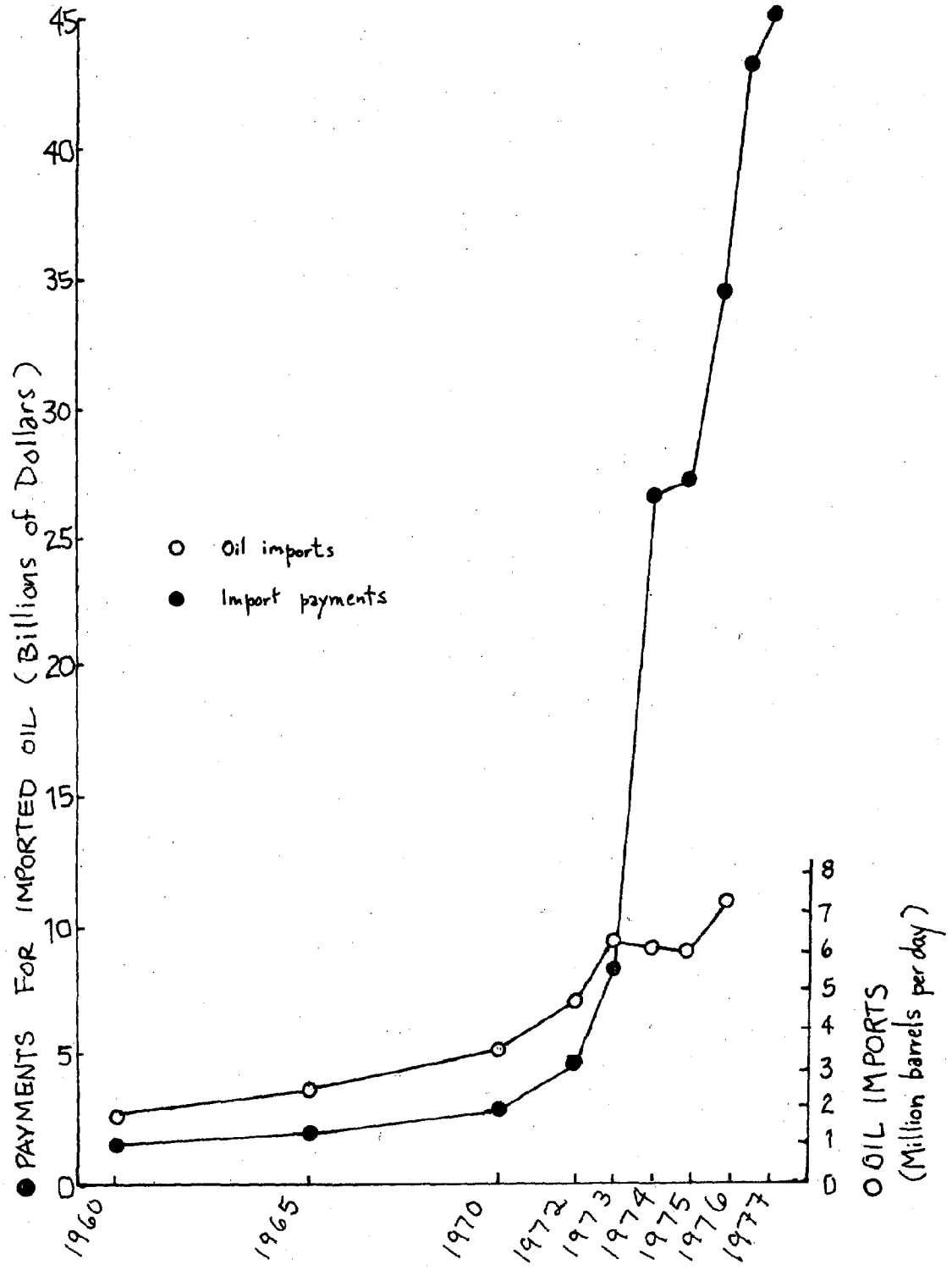

Figure 2 Quantity and Cost of U.S. Oil Imports

Source: Department of Commerce, Bureau of Mines

A. More and more presently untapped domestic reserves of oil, coal, and uranium will be developed as increasing demand justifies the use of more expensive methods and technologies. The end consequences will almost invariably be higher costs.

B. Reserves of oil, coal, and uranium are finite and no matter how high prices rise or how sophisticated technology becomes, they will eventually be exhausted. If by that time alternate renewable energy resources have not been developed, the consequences for society as a whole will be almost unimaginably far reaching and profound.

C. The final depletion of conventional energy reserves is difficult to forecast, but shortfalls in petroleum, natural gas, and uranium as early as the mid to late 1980's have been suggested by a number of experts. If a relatively open world market for these fuels continues into the future, the possibility of shortfalls in United States supply may be reduced or delayed.

D. Many studies (for example, CIA, WAES) indicate it is only a matter of time before demand for petroleum outstrips the supply because the discovery of reserves has not kept pace with rising demand.

E. The energy policy decisions of countries possessing uranium reserves will play a key role in determining the 20-30 year availability of uranium to the United States.

F. Significant technological, environmental, and transportation obstacles impede the increased use of coal, though vast quantities are recoverable.

IV. Rhode Island and New England as a whole are particularly vulnerable to energy supply disruptions caused by international competition and dependence on foreign sources.

A. New England is heavily dependent on petroleum products as the principal fuels for transportation, home heating, and power generation. Sixty-three percent of the residential/commercial energy and 77 percent of the industrial energy consumed in the region is oil-derived, as opposed to 37 percent and 38 percent respectively for the nation.

B. Only one-fifth of the oil consumed in the region is from domestic sources.

Per Capita Energy Consumption, Millions of BTUs (1976 Data)

	Residential and Commercial	Industrial	Transportation	Total
Rhode Island	75.5	37.6	64.5	177.6
New England	75.4	39.7	69.9	185.0
United States	57.9	102.9	91.9	251.5

Total Energy Consumption in Rhode Island, Trillions of BTUs (10^{12})

	Oil	Gas	Coal	Electricity
1972	167.7	22.4	0	15.3
1973	159.1	23.5	0	16.4
1974	126.1	24.1	0	15.5
1975	142.8	23.1	0	15.1
1976	143.3	27.7	0	16.5
1977	na	na	na	16.4

Comparative Prices for Energy, Dollars per Million BTUs (1976 Data)

	New England	United States	Difference in NE (%)
Heavy Oil	2.02	1.85	+9.1
Gasoline	3.66	3.80	-3.5
Fuel Oil	3.08	2.94	+4.8
Gas	3.31	1.60	+107.0
Electricity	12.25	8.47	+44.6
AVERAGE	4.06	3.22	+26.0

Table 1 Energy Consumption and Energy Price Data in New England and Rhode Island

Sources: Geoffrey Bentley, New England Energy Factbook, New England Congressional Caucus, 1978; Electric Council of New England, Electric Utility Industry in New England, Statistical Bulletin, 1976; Rhode Island Public Utilities Commission, Annual Reports of gas and electric utilities; Rhode Island Fuel Allocation Office, records kept for fuel allocation program; Arthur D. Little , Inc. Historical Data on New England's Energy Requirements, New England Regional Commission, 1974; Intermetrics, The Petroleum Distribution Network for New England, New England Regional Commission, 1974.

C. The vulnerability of Rhode Island's oil supply and its heavy reliance on oil as a home heating fuel are exacerbated by New England's inclement weather. As a result, per capita annual residential/ commercial consumption of 75.5 million BTUs exceeds the national average of 57.9 million BTUs (1976 data). This contrasts to consumption in other sectors, where Rhode Island falls below national averages (see Table 1).

D. Rhode Islanders pay a heavy economic penalty for the New England region's dependence on foreign sources of energy and its distance from domestic sources. We are among the nation's most frugal consumers of energy, yet we pay its highest prices.

- Total energy consumption per capita in Rhode Island is only 70 percent of that for the nation as a whole and is also less than the New England average of 185 million BTUs (1976 data).

- However, New Englanders pay some 26 percent more for energy than the national average. Gasoline is the only fuel that is cheaper in New England than in the nation as a whole.

V. Rhode Island and New England are not endowed with the readily accessible fossil fuel resources upon which our society has become dependent. However, untapped "native" energy sources do exist and their potential to contribute to the region's energy needs requires careful examination and consideration.

A. An attractive attribute of such native energy sources as wood, hydropower, wind, solar power, and solid waste is that they are "renewable". If properly managed, the supply will continue indefinitely in contrast to fossil fuels of which there are a finite amount which once depleted cannot be replenished.

B. Development of native energy sources, if accomplished in an environmentally and economically sound manner, is desirable as it will reduce the state and regional vulnerability to supply and price factors beyond our control.

C. Present technology and energy consumption habits suggest, however, that native energy resources can fill only a small portion of present demand. (Assessments of native energy resources are discussed in Sections 240.0-1 and 540.2-1, A. These Sections have been updated and are appended to this draft.)

VI. Energy conservation in all its various forms must be recognized as a major domestic energy resource in its own right, a resource in which New Englanders should be particularly interested for the enhanced opportunities it offers them to assume a greater level of control over their energy future. However, energy conservation offers no panacea. It will involve behavioral changes and expenditures which only become attractive in light of the alternative. In this regard, it is similar to most other existing and potential energy resources.

A. Two principal strategies for conserving energy are available. These may be categorized as structural/technological approaches (e.g., improving insulation) and behavioral modification (e.g., turning down thermostats).

B. Structural/technological solutions appear to provide the greatest short term potential for reducing energy consumption. They are attractive for a number of reasons:

- They address an area where the potential for savings is particularly great; Rhode Island's residential and commercial use of energy.

- They are amenable to government influence through mandatory standard setting such as building code modifications and through voluntary programs such as tax relief for improving insulation.

- Technology is available to implement them.

- Rising fuel prices make structural/technological investments which reduce fuel consumption increasingly attractive.

- Perhaps most importantly, they require no fundamental change in life style or behavior.

C. Behavioral modification, while more difficult to implement, is absolutely crucial to long term and continued reduction of energy consumption. Several factors must be considered in assessing the potential for behavioral change:

- Historically abundant and cheap energy has led to consumption patterns which we must now consider wasteful.

- Education of the public as to the need for changes in behavior and the consequences of continuing to live beyond our energy means is critical if we are to move beyond reacting to changes that have already occured to preventing changes we foresee as undesirable.

D. The area of consumption where the greatest short term savings can be made is in the residential/commercial sector. Half the state's energy consumption is by this sector and 70 percent of this energy is for space heating. Retrofitting of existing structures and improved construction techniques for new structures could reduce energy consumption considerably.

- Retrofitting of existing buildings to improve heating efficiency could reduce their energy consumption by 25 percent.

- Building energy saving into new buildings is typically cheaper than retrofitting and provides greater long term savings in consumption (up to 40 percent).

- As the cost of heating fuel continues to rise, the pay back period for structural improvements (presently 2-10 years) becomes less, thereby making them more attractive financially. In addition, behavioral changes such as the lowering of thermostats pay ever increasing financial dividends.

E. Savings in energy consumption can also be made in the industrial sector by retrofitting and building improvements into new structures. However, because industry only accounts for some 11 percent of total Rhode Island consumption, these will not be of a magnitude comparable to those possible in the residential/commercial sector.

F. Long term improvements in the efficiency of fuel use, although not necessarily the amount of fuel used, for electric power generating can be realized by building appropriate features into new power plants.

- Two-thirds of the energy consumed to generate electricity is lost as waste heat which is discharged up smoke stacks and removed by cooling water. This "lost" energy accounts for some 6 percent of total Rhode Island energy consumption.

- Proven technology exists and is widely employed in Scandinavia to make economic use of "waste" heat. Swedish power plants, for instance, use 24 percent of what would otherwise be wasted energy to heat buildings and run industrial processes.

- New power plants can be designed and sited to take maximum advantage of cogeneration and district heating possibilities. The former of these technologies involves the use of "waste" heat to drive industrial processes, the latter to heat buildings.

- While cogeneration and district heating technologies involve additional expenditures during plant construction, they generate revenue over the life of the facility.

G. Transportation accounts for some 25 percent of total Rhode Island energy consumption (1974). Sixty percent of this is consumed by private automobiles, while only 25 percent is used by trucking and mass transit. Transportation related consumption of energy by the private sector is not well suited to structural or technological solutions and numerous obstacles exist to implementing fundamental behavioral changes. However, rising gas prices and smaller cars may bring a significant reduction in the energy consumed for transportation purposes.

H. The State of Rhode Island through the Governor's Energy Office has taken action to implement a state level conservation policy.

- A State Energy Conservation Plan was submitted to the federal Department of Energy in January 1978.

- Some fourteen programs including four mandatory structural/technical programs and ten educational/promotional programs were proposed.

- Reductions in state energy consumption as a result of program implementation are projected at 7.5 percent of the anticipated growth in energy use by 1980.

- Procedures for annual evaluation and improvement of each program are in place.

VII. Projecting future demands for energy in general and for specific sources (oil, gas, electricity) in particular has become increasingly difficult, complex and uncertain. This has greatly complicated the formulation of public energy policy, particularly as it relates to the development of energy resources and the siting of energy related facilities.

A. For a number of reasons not clearly understood at this time, but certainly including the disruption of oil supplies caused by the 1973 Arab oil embargo and the rapidly rising price of petroleum products since then, Rhode Island energy consumption patterns have begun to fluctuate and well established trends have been broken.

- The relatively regular increase in consumption typical of the post World War II decades is no longer evident.

- After dropping precipitously in 1973 and 1974, oil consumption had not recovered to 1972 levels by 1976 (see Table 1).

- Gas consumption has grown somewhat, although sporatically (see Table 1).

- Electric power consumption has also grown, but at a slower rate and more unevenly than gas (see Table 1).

B. Controversy surrounds the exercise of projecting demand.

- Depending on the methods used and the assumptions made, projections can differ sharply. For example, assessements by Exxon Corporation and the Council on Environmental Quality on the future mix of energy supply have developed significantly different forecasts on the importance of solar energy. Exxon sees less than one percent of United States energy demand being met by solar in 1990 while CEQ suggests a 25 percent contribution is possible by 2000.

- Environmental considerations and political factors (many of them international in scope) complicate the historic correlation between population, economic activity and energy consumption. The old equations are faring poorly at the hands of the new realities.

- Econometric models from which demand projections are developed are based on historic patterns and trends. The disruptions and fluctuations of the last few years render the applicability of historical data to the forecast of future demand suspect.

- Future prices of various fuels are a key variable in econometric forecasting. The uncertainty surrounding the availability and price of these fuels can produce a wide range of projections.

C. The distinction between a good and a bad projection is a subjective judgement and one with important policy implications. It is critical, therefore, that demand projections and the methods and assumptions upon which they are based be subjected to careful and regular scrutiny and criticism. It is equally critical that those bodies of government charged to implement public energy policy have access to a variety of projections based on a variety of updated assumptions prior to making the important decisions that confront them.

VIII. The ability to project with confidence the types and numbers of energy related facilities that might be sited in the Rhode Island coastal region or in areas likely to affect the coastal region in the foreseeable future is central to developing and implementing energy facility siting policies.

While as noted above, the uncertainties of demand projection complicate the effort to identify likely siting pressures, there is sufficient evidence in the form of ongoing developments to identify a number of siting decisions that are likely to confront the state in the future.

Additional predictive capability is obtained by application of the Resources and Land Investigation Program (RALI) methodology developed jointly by the U.S. Geological Survey and the New England River Basins Commission.

A. Proposals with a high probability for the short term (1-5 years) include:

- A proposal to construct two 1150 megawatt nuclear powered electric generating units in the Ninigret Pond area of Charlestown.

- A proposal to build a solid waste resource recovery/waste heat recovery facility with an electric power generating capacity of 30 megawatts.

- Two proposals to retrofit existing dams to generate power for onsite consumption.

- A proposal to install a 200 kilowatt windmill as a federal Department of Energy demonstration/feasibility project on Block Island.

- A proposal to build an LNG regassification plant, tank storage and pipeline terminal on the southern end of Prudence Island has been considered by the Federal Energy Regulatory Commission (FERC).

- The deactivated naval fuel storage depot at Melville on the east shore of Narragansett Bay is being examined for possible restoration and reuse under the auspices of the Emergency Fuel Supply Storage Program.

- The former Quonset Point/Davisville Navy base is already the major support base for OCS oil and gas exploration in the Baltimore Canyon area and is likely to serve the same function for exploration on Georges Bank.

- Individual solar and wood appliances for space and water heating of homes and small buildings are spreading rapidly. Photovoltaic electrical generating systems are available on a cost competitive basis for commercial buildings.

B. Proposals with a moderate to high probability for the mid term (5-15 years) include:

- Expansion of OCS support facilities at Quonset Point/Davisville to service OCS oil and gas development during the late 1980's; this could include platform fabrication, pipe coating and laydown yards and related facilities (see Section 540.2).

- Construction of a gas pipeline from OCS frontier areas to a landfall along the southern or southeastern Rhode Island coastline; construction of two 600 million cubic feet per day gas processing and fractionation plants in a rural coastal or near coastal site along the pipeline right-of-way.

- Continued expansion of individual, residential solar and wood space and water heating systems; photovoltaic systems for residential use by the 1990's.

- Continued expansion of small scale wind powered generating systems and retrofitting of additional dam sites for onsite hydropower operation.

C. Proposals with a moderate to high probability for the long term (beyond 15 years) include:

- Decommissioning and securing of the Charlestown nuclear plants some 30 to 40 years after operation commences (asssuming a construction go ahead).

- Decommissioning and reuse of Quonset Point/Davisville OCS support facilities some 20 to 25 years after production begins in the late 1980's/early 1990's.

- Development of large scale solar, wood biomass, and wind powered technologies for the commercial generation of electricity.

D. Low probability proposals in light of resource constraints and/or lack of anticipated demand include:

- Nuclear fuel cycle facilities including processing, reprocessing, and long term waste storage/disposal.

- Additional tank storage facilities for petroleum products.

- Oil refineries

- Deepwater ports and/or monobuoy emplacement.

- Construction of OCS oil pipelines across Rhode Island lands or waters.

E. Proposals whose probability is difficult to assess on the basis of present knowledge of resource, availability and projected demand include:

- Mining and processing of in-state coal reserves.

- Construction of coal fired electric power plants.

IX. Decisions on what energy related facilities will be sited in Rhode Island, where, when, and under what conditions must be made with a clear appreciation that they provide the most direct, forceful and meaningful vehicle for implementing public energy policy and directing the state's energy future. They cannot, therefore, be made on an ad hoc basis. More than the direct and immediate impacts, whether social, economic or environmental, of a particular siting proposal must be considered.

Energy is not a luxury, but a necessity. The availability and reliability of energy supplies and their cost are critical factors influencing every stratum and sector of society. Energy facility siting decision making criteria must address not only site specific impacts, but wider ranging and cumulative impacts as well. Tradeoffs must be made with an understanding of their many implications.

A. It is critical to the reasoned evaluation of an energy facility siting proposal to appreciate that in every important respect the impacts that may result, both good and bad, will be generated by a complex interaction between facility and site. In this regard energy facility siting is no different in nature, although certainly in significance, from any other siting action.

- Lines of cause and effect, action and reaction between facility and site are rarely, if ever, unidirectional.

- The site by its characteristics and resources whether these be physical, biotic or social offers opportunities and imposes constraints which define both its attractiveness to the potential developer and the changes he must make to render it suitable to his purposes.

- These same characteristics and resources influence the manner in which the site will react to development. Reaction in the form of change is inevitable, but whether it is beneficial or detrimental depends largely on the unique combination of factors that define it and their individual and collective tolerance to particular changes.

- The wide range of considerations that go into identifying a desirable site for an energy facility from the perspectives both of their proponents and those charged with regulating them suggests that in the majority of cases the affected "site" extends far beyond the facility perimeter and may, in fact,

incorporate the state as a whole or even the entire New England region.

- The large size of the "site" affected by a particular siting decision vastly complicates the job identifying and evaluating its impacts. These may effect a wide variety of environmental and social interests and it becomes extremely unlikely that any consistent pattern of "good" or "bad" impacts will emerge. An overall assessment which accomodates the full range of interests affected and impacts anticipated must be undertaken and tradeoffs between conflicting interests are inevitable.

- No hard and fast method exists to make these tradeoffs and making them will remain a subjective exercise the adequacy of which will be measurable only in reference to articulated energy policies and objectives.

- Tradeoffs can and should, however, be identified on the basis of a consistent and uniformly applicable methodology which addresses the interactions described above.

B. On the broadest level a basic concern regarding the evaluation of energy facility siting proposals is the cumulative impacts that separate decisions made over time may have on broad development patterns and on the quality of life available to Rhode Island's citizens.

- Each individual siting decision although of potentially minor consequence in and of itself contributes to one pattern of development and/or detracts from another.

- Implementation of any set of coherent policy objectives over time requires that incremental siting decisions be made with a clear appreciation for their impacts on the pattern desired. Long range planning and development policy must consequently be a primary siting consideration.

C. Reasoned evaluation of an energy facility siting proposal must also address the spread and phasing of various positive and negative impacts over time. An appreciation of the "life cycle" characteristics of a particular facility is a critical siting consideration.

The fact that impacts will only accrue far into the future does not minimize their importance in determining the overall desirability of a facility throughout its life time.

- Energy facilities generate impacts over the entire course of their lives beginning with planning and site identification, continuing through construction and operation and extending into decommissioning.

- These impacts may be ecological, in that the functioning of the environment is altered thereby affecting man, other organisms, and their habitsts; economic in the form of employment and construction related expenditures; and social in the form of potential changes in population size and the demand placed on municipal services.

- Each of these phases in the facility life cycle has predictable characteristics and identifiable impacts which must be considered in evaluating the desirability of a given siting action.

- A comprehensive evaluation must, moreover, weigh the full range of impacts throughout the duration of the life cycle because the distribution over time of positive and negative impacts may be uneven.

- Decommissioning impacts, such as long term commitments of valuable real estate and coast of securing hazardous materials should be given particularly careful scrutiny.

D. Evaluation must further address questions of reliability, adequacy, and need in an age of growing uncertainty.

- Maintenance of reliable and adequate supplies of energy is critical to the public's welfare. Given the growing uncertainties regarding recoverable reserves, cost and political interference with the delivery of many conventional fuel sources, the continued

availability over time of the fuels upon which new facilities such as electric generation plants will depend cannot be taken for granted.

- It may become increasingly desirable, therefore, to build facilities capable of utilizing a variety of fuel sources, especially those fuels indigenous to the region.

- It may further become desirable to decrease reliance on one or two fuel sources to meet basic needs. Recent history has provided several examples of the dangers of overdependence; the 1973 OPEC oil embargo, the natural gas shortages in the mid-West during the winter of 1976-77, and the summer 1977 blackout of New York City, to name three. There will be growing safety in diversity.

- Maintenance of reserve margins of supply and capacity to provide for supply disruption and unanticipated demand surges is an important consideration in facility development. However, given present uncertainties as to future demand in light of recent developments, the question of what an adequate reserve margin is has become highly conjectural. It may become desirable in this context to look to smaller facilities which can be placed on line relatively quickly as an alternative to large centralized facilities with their long lead times.

- The basis upon which the need for a new facility is determined, including the methodology and assumptions supporting that determination, are essential ingredients in making a facility siting decision. The need for and feasibility of a particular proposal is important in examining the range of feasible site and project alternatives and making benefit-cost determinations.

X. Seven agencies and bodies of state government are directly involved in the formulation or implementation of state energy facility siting policies.

A. The Executive Office of the Governor establishes the broad policy context within which all executive departments operate.

- In his January 1977 inaugral message to the General Assembly, Governor Garrahy set forth the following state energy objectives:

  . To develop a conservation program that is fair to all users;

  . To undertake a vigorous search for alternative energy sources such as solar energy and an imaginative use of older sources such as hydropower;

  . To improve regulation of utilities in order to foster stabilized rates and greater efficiency;

  . To safely develop the outer continental shelf in a manner which fully considers all legitimate concerns including energy use, employment benefits, environmental impacts and the state's fishing industry;

  . To site energy facilities in light of state plans rather than private industry decisions.

- Further policy direction was provided by the Governor's 1978 Annual Message to the Assembly at which time he stated: "An energy policy for Rhode Island requires examination of all sources of energy to determine the best available mix for both present and future, and we must analyze each source as to availability, cost, efficiency, safety, environmental impact, and overall effect upon our economy".

B. The Rhode Island Energy Office was created by Executive Order No. 25 on May 1, 1975 and restructured by Executive Order No. 9 issued on May 19, 1977. The Energy Office consists of an Energy

Conservation Program responsible for the preparation and implementation of the State Conservation Plan prepared under the provisions of the Federal Energy Policy and Conservation Act of 1975, and the Energy Capability Program responsible for energy research and for development of new and alternative energy sources.

- The Energy Office drafted and submitted House Bill 8106 "The Energy Facility Siting Act" to the 1978 session of the General Assembly. A legislative study committee was created to study and report on this bill when the Assembly reconvenes in January of 1979. H 8106 would augment existing state siting authorities by creating a new energy facility planning process undertaken by the Statewide Planning Program and by establishing an Energy Facility Siting Council to coordinate the activities of existing regulatory bodies. The Siting Council would be empowered to overrule such bodies subject to prescribed limitations. Directors and Chairman of the Department of Environmental Management, the Coastal Resources Management Council and the Public Utilities Commission would be ex officio voting members of the Siting Council.

C. The Public Utilities Commission and the Division of Public Utilities under Title 39 of the General Laws have the responsibility of ensuring that gas (including LNG), electric and pipeline public utilities pro-vide abundant, reliable and economical energy to the state's citizens and, further, that they do so "with due regard for the preservation and enhancement of the environment, the conservation of natural resources including scenic, historic, and recreational assets, and the strengthening of long range land-use planning" (39-1-1(3)). To this end, the Commission (PUC) has the following authorities:

- Before any utility granted access to the power of eminent domain by legislative charter can condemn land, it must obtain authorization in the form of a certificate from PUC (39-1-31). It must describe the land, right-of-way or easement it proposes to acquire and why it must do so by eminent domain. PUC may issue a certificate only if it finds after public hearing:

. That the proposed condemnation serves the public benefit;

. That it is necessary so that adequate service may be rendered to the public;

. That the proposed use will not unduly interfere with orderly and scenic development of the region.

- Parties aggrieved by decisions or orders of a municipal zoning board or of building, gas, water, health or electrical inspectors affecting companies under PUC's supervision may appeal those decisions or orders to the commission within 10 days (39-1-30). After hearing, PUC may affirm, overrule or modify the municipal decision or order upon weighing it against consideration of public convenience, necessity and safety. Similar procedures apply to the promulgation of municipal ordinances and regulations affecting the operation of PUC supervised utilities.

- Public utilities may not issue bonds or notes payable more than 12 months from date of issue to acquire property, build or expand facilities without authorization from the Division of Public Utilities (39-3-15).

D. The Department of Environmental Management is responsible for state implementation of various provisions of the Federal Clean Water Act and the Clean Air Act Amendments of 1974 which are applicable to energy facility siting. In addition it enforces the Rhode Island Freshwater Wetlands Act of 1971.

- Under Title 23, Chapter 25 of the General Laws, the Department promulgates ambient air quality standards, regulates new stationary sources of air pollution and enforces non-degradation criteria applicable to areas where air quality exceeds ambient standards. It may require new stationary sources of air pollution to install a variety of pollution control devices or may prohibit air emissions altogether where applicable standards would be violated (see Section 330.0).

- Under Section 40 of the Federal Clean Water Act, the Department acts as the certifying body for discharges into the state's waters. No such discharge may be permitted by any state or federal license or permit issuing body until an applicant obtains DEM certification of compliance with applicable water quality standards and schedules (see Section 310.7). Conditons and limitations attached to the DEM certification must be reflected in subsequent actions by other regulatory bodies.

- Under Title 2, Chapter 1 of the General Laws, the Department regulates the alteration of freshwater wetlands with the objective of preserving their purity and integrity and preventing loss of flood water retention capacity, reduction of ground water quality or levels and destruction of wildlife habitat and recreational value. A DEM permit must be obtained before any freshwater pond, stream, river, swamp, marsh or bog may be filled, drained or otherwise altered (see Section 250.3).

E. The Statewide Planning Program in the Department of Administration performs several functions which, while not regulatory in themselves, affext the regulatory activity of other state agencies involved in energy faciltiy siting.

- The Program has principal responsibility for preparation of the State Guide Plan which identifies long range goals and plans for the physical, economic and social development of the state. Conformance with the State Guide Plan is required of state agencies such as CRMC and the Economic Development Corporation.

- The Program serves as the state clearinghouse for the Project Notification and Review System established by Office of Management and Budget Circular A-95. In this capacity it notifies responsible state agencies of proposed federal actions, grants and license applications affecting their responsibilities and serves as a focus for state comment and reaction to these proposals. The clearinghouse function is a vital link in state implementation of the Federal consistency provisions of the Coastal Zone Management Act of 1972 (see Appendix C5).

F. The Coastal Resources Management Council under Title 46, Chapter 23 of the General Laws as amended exercises regulatory responsibilities affecting energy facility siting in two broad areas.

- The Council enforces regulations and carries out permit programs governing alteration and use of a variety of coastal land and water areas and features (see Chapter 1). These regulations and programs apply equally to all uses of these areas including the construction and operation of energy facilities and many of the activities associated with construction and operation including, but not limited to, marine construction, dredging, filling and site alteration.

- The Council enforces similar regulations and implements permit programs governing "the design, location, construction, alteration and operation of specified activities or land uses when these are related to a water area under the agency's jurisdiction, regardless of their actual location" (46-23-6B). Two considerations apply in establishing the required relationship. These include a reasonable probability of conflict with a plan or program for resources management or damage to the coastal environment". Power generating plants and petrochemical processing, transfer or storage facilities are among the land uses regulated under this provision of the General Laws.

- All Council regulations and permit programs, including those affecting energy facility siting, must be developed around basic standards and criteria established by law. These include:

  . Need and demand for activities;

  . Impact of activities on ecological systems;

  . Compatability of activities;

  . The capability of coastal resources to support activities;

- State water quality standards;
- Consideration of other plans, studies, surveys, and inventories;
- Consideration of contiguous land uses;
- Consideration of transportation facilities;
- Consistency with the State Guide Plan.

G. The General Assembly pursuant to Title 42, Chapter 64-14.1 of the General Laws as amended has reserved to itself final and exclusive authority to make the determinative state level decision regarding "project plans" for nuclear power plants and oil refineries.

- As repeatedly used elsewhere in Chapter 64 and as defined under 4C-64-3(r), "project plans" refers specifically and only to projects in which the Economic Development Corporation has an interest through financing or ownership.

H. In addition, the Rhode Island Port Authority and Economic Development Corporation is a quasipublic body created by act of the General Assembly (42-64;CLRI), but "having an existence separate and aprt from the state". The Port Authority is authorized to undertake "utility facility" projects. These can include facilities for the generation, manufacture, production, storage, transportation, distribution, delivery or furnishing of natural or manufactured gas, steam, electrical or nuclear energy, heat, light or power directly or indirectly to or for any project, project user or for the public.

XI. Coordination and cooperation among those state agencies and bodies of government involved in the formulation and implementation of energy facility siting policies for purposes of implementing the objectives of the Rhode Island Coastal Management Program is mandated by Titles 46, Chapter 23 and 42-64 of the General Laws, as amended and by Executive Order No. 17, dated November 16, 1977.

A. Title 46, Chapter 23 sets forth basic coordinating responsibilities of the Coastal Resources Management Council necessary to implement its "primary responsibility (for) the continued planning for and management of the resources of the state's coastal region". These include authority to:

- Carry out resources management programs through implementing authority and coordination of state, federal, local, and private activities (46-23-6A(f)).

- Function as a binding arbitrator in any matter of dispute involving both the resources of the state's coastal region and the interests of two or more municipalities or state agencies (46-23-6C(a)).

- Initiate consulting and coordinating actions with local, state, regional, and federal agencies (46-23-6C(b)).

B. Title 46, Chapter 23-10 further "authorizes and directs all other departments, agencies, and bodies of state government to cooperate with and furnish such information as the Coastal Resources Management Council shall require".

C. Title 42, Chapter 64-14(b) requires that in planning and carrying out projects (including those related to nuclear power plants and oil refineries), the Economic Development Corporation must "conform to applicable provisions of Chapter 46-23 of the General Laws", thereby insuring that in making its final and exclusive decision regarding such facilities, the General Assembly may be assured that issues related to coastal management plans and programs have already been considered by the Coastal Resource Management Council.

D. Executive Order No. 17 specifically recognizes that "the Coastal Resources Management Council is established by law as the principal agency to administer and implement the state's Coastal Resources Management Program. It further directs the Council, the Departments of Environmental Management and Health, the Statewide Planning Program and "all appropriate agencies of state government" to "act in accordance with the policies and objectives of the Management program to the extend consistent with State statutes and regulations".

POLICIES AND REGULATIONS

I. POLICY OBJECTIVES - The Council finds the following policy objectives to be consistent with its own findings and with expressions of state energy policy articulated by the Governor and other agencies and bodies of state government.

The Council finds also that implementation of these policies will add to existing stores of knowledge on the state's energy options, will open up new options, and will contribute to the continued availability of a variety of safe and reliable energy sources; and further that by so doing, it will contribute to the long term benefit of all Rhode Islanders as the state enters an era of growing energy uncertainties.

A. Alternatives to each energy facility siting commitment must be vigorously explored; not on the basis of any prior presumption that such commitments are undesirable per se, but rather in the belief that only through such exploration will existing options be retained, new options opened, and the best option chosen.

B. The full range of issues associated with and implications of each energy facility siting commitment must also be vigorously explored. These will include, but are not limited to, consideration of:

- Environmental, economic and social impacts on affected communities, the state and the region throughout the entire life cycle of the facility including decommissioning;
- State, regional and national needs;
- Impacts including cummulative impacts on long term development patterns and on local, state, and regional plans.

The process for continued

C. Diversification of sources, technologies, size and distribution of facilities should all be encouraged.

- Native energy sources such as wood, hydropower, wind, solar energy, solid waste and coal and technologies to utilize them should be developed to the maximum extent consistent with environmental preservation; not as a short term substitute for, but rather as a supplement to "conventional" sources.

- The capability to use a variety of fuels to produce heat, electricty or industrial products should be encouraged in new developments;

- Dependence on a relatively limited number of fuel sources and generating technologies by the electric industry should be discouraged. Alternative technologies, reductions in scale and decentralization all require careful consideration.

D. Conservation programs both as they relate to structural and technological improvements in the efficiency with which energy is consumed and to changes in behavior which reduce demand should be vigorously pursued.

Conservation should not be seen as an alternative to energy resource development, but rather as an indigenous source of increased energy supply in itself.

II. SCOPE AND APPLICABILITY

A. The following categories and classes of facilities demonstrate a reasonable probability of affecting the environment of the coastal region including its many physical, biological, social and economic resources. They demonstrate a similar probability of affecting or being affected by resources management plans and programs as these are reflected in the Findings and Policies contained elsewhere in the Coastal Management Program.

1. Facilities for the generation of electricity for wholesale and retail sale and transmission lines related thereto;

2. Petroleum processing, transfer or storage facilities including facilities for conversion, regassification, fractionation, treatment, transfer or storage of petroleum gases including natural gas, liquified natural gas (LNG) and liquified propane gas (LPG); facilities for the refining, transfer or storage of oil and other petroleum products such as gasoline, heating oil and kerosene; pipelines for the transportation of petroleum products and gases in, under or over the state's tidal waters or across or through the coastal region.

B. In order, therefore, to properly and effectively discharge legislatively delegated responsibilities related to the location, construction, alteration and/or operation of such facilities, the Council shall require a permit for such location, construction, alteration and/or operation anywhere within the State of Rhode Island subject to the following conditions.

- This requirement will be waived upon a clear and convincing demonstration before the Council that the environment of the coastal region will not be affected by the proposed action in any manner that is of recognized concern to the Council as indicated in Findings contained in the Coastal Management Program; and upon further demonstration that this action is not subject to any Council Policy or Regulation pertaining to any coastal resource, area or use.

- In making such demonstrations, parties seeking a waiver shall provide reliable and probative evidence to the Council.

- Actions as set forth under (1) and (2) above which are proposed to be located within the coastal region or which propose to withdraw water from or discharge water into any water body emptying into tidal waters in such quantities or fashion that the quantity, quality or chemistry of waters entering tidal waters is measurably changed shall for purposes of these regulations be conclusively presumed to have a reasonable probability of affecting the environment of the coastal region and petitions for waiver will not be entertained.

- For purposes of these regulations, the term "effect on the environment of the coastal region" shall be broadly construed to include effects on the social as well as natural environment including, but not limited to effects on public services, development patterns and the economy.

- The Council shall make all determinations on petitions for waiver of these requirements subject to rules of procedure, notice and hearing as set forth in Appendix B, Management Procedures.

C. The Council may at its sole discretion waive the requirements of this section as they apply to facilities for the generation of electricity for private onsite use.

D. The Council may at its sole discretion waive the requirements of this section except for those set forth under subsection IV-C (need for shorefront sites) as these relate to facilities for the storage of oil and other petroleum products of less than 2,400 barrels gross capacity.

III. POLICY IMPLEMENTATION

A. The Council finds that an obstacle to effective implementation of energy facility siting policies in the Rhode Island coastal region is the incremental issuance of permits and licenses at all levels of government relating to various aspects or impacts of a given proposal, but short of review and approval of the proposal as a whole.

B. In order to ensure that such incremental decision making does not impede policy implementation affecting the Rhode Island coastal region while at the same time making maximum effective use of the superior expertise of sister agencies in their areas of jurisdiction, the Council shall discharge its regulatory responsibilities regarding energy facility siting, construction and operation in the below described manner.

C. Direct Council Actions:

1. The Council shall issue no separate or independent permits under its authority regarding any discrete aspect or impact of, or alteration required by, or activity associated with the construction or operation of a facility subject to these regulations including, but not limited to, permits to alter tidal waters, coastal ponds, and shoreline systems.

   The issuance of such permits shall only be considered as part of and in relation to the issuance of the required Council permit for the proposed facility as a whole.

   The above prohibition shall not apply to permits for activities or alterations necessary to conduct tests, surveys or other investigations of a site by an applicant; provided that such tests, surveys or investigations shall be subject to all applicable policies and regulations set forth elsewhere in the Coastal Management Program.

2. The above prohibitions and conditions shall apply also to the issuance of separate and independent permits or determinations of consistency regarding actions for which the Army Corps of Engineers requires an applicant to obtain state authorization before issuing a federal permit. More particularly these include dredging or filling of coastal wetlands and navigable waters, transportation and disposal of dredged material and construction in navigable waters.

D. Other Permits Required: Applicants for a Council permit subject to these regulations shall be required to first obtain and submit with their application copies of the below described authorizations.

1. Local: The applicant must obtain all required approvals for the proposed action including zoning variances, exceptions or other special relief as applicable.

The Council may, in its sole discretion, waive any of the above required approvals for good cause or in the event the proposal is of more than local concern. Granting of such waivers shall only be considered in the following circumstances:

- Upon demonstration by the applicant that he has duly applied in the form and manner required by local ordinance for all permits, licenses, variances and other forms of municipal authorization; that he has been denied one or more of these authorizations; and that he has exercised and exhausted all avenues of administrative appeal and remedy available to him at the municipal level of government.

- For public utilities subject to the appeals provisions of Title 39 Chapter 1-30 of the General Laws, upon further demonstration by the applicant that the Public Utilities Commission has overruled or modified an adverse municipal decison, order or ordinance in the interest of public convenience, necessity and safety as broadly construed.

- For nuclear power plants and oil refineries which are "project plans" of the Economic Development Corporation, upon further demonstration to this Council that an adverse municipal decision or order is in conflict with the adopted municipal master plan; and/or is in conflict with the State Guide Plan or any of its elements; and/or fails to address and consider officially adopted state and national energy policies

and priorities, and to the extent that these can be reasonably applied to a specific proposal on a specific site, is incompatible with said policies and priorities.

Where such demonstrations are made, the Council pursuant to procedures set forth under E below may recommend to the General Assembly that it overturn or modify the municipal decision or order in exercising its final and exclusive permitting authority.

2. State: The applicant must first obtain all required authorizations for the proposed action from other agencies and bodies of state government including, but not limited to:

   - Certification of compliance with water quality standards by the Department of Environmental Management (DEM) subject to the requirements of the Federal Clean Water Act;

   - Certification of compliance with air quality standards and applicable pollution abatement requirements of the Clean Air Act Amendments of 1974, also by DEM;

   - Permit to alter freshwater wetlands (if applicable) from DEM;

   - Permit for onsite treatment and/or disposal of sewage from DEM.

   In addition, the Statewide Planning Program shall review all proposed actions for consistency with the State Guide Plan and shall notify the Council of its determinations prior to the issuance or denial of the required permit.

3. Federal; The applicant must first obtain a water discharge/outfall permit from Region 1 of the Environmental Protection Agency as required by the National Pollution Discharge Elimination System provisions of the Federal Clean Water Act.

E. Participation By Other Agencies of Government in Council Proceedings:

1. As provided for in Appendix C, "Management Procedures" of the Rhode Island Coastal Management Program, the Council shall in all cases notify interested agencies of local, state, regional, and federal government of the receipt of applications for any facility subject to regulation under this section.

2. Said agencies shall be provided an opportunity to comment in writing on the proposed action under consideration before the Council. This opportunity shall be in addition to any actions taken or determinations made by these agencies pursuant to other authorities, ordinances or statutes.

3. Said agencies shall further be accorded the status of parties to any formal proceeding before the Council required under these regulations and shall have all associated rights and privileges.

F. Regulation of Economic Development Corporation Projects: The siting, construction, alteration or operation of nuclear power plants and/or oil refineries which meet the criteria for "projects" or "project plans" of the Economic Development Corporation as these are set forth under 42-64-3(r) of the General Laws shall be regulated as prescribed elsewhere in this section; provided that the Council shall forward to the General Assembly for final deliberation and action the following:

1. A record of all evidence submitted to and evaluated by the Council;

2. Findings of fact on the proposed project or project plan;

3. Recommendations regarding the issuance, denial or modifications of a final permit based on the Council's evaluation of the record and findings.

IV. PERMIT REQUIREMENTS, CONTENTS AND REVIEW

A. Applicants for Council permits for those categories and classes of energy facilities identified in Section II of these regulations shall be required to submit the below described information:

1. Two copies of Application Form CRMC 8-1/74 shall be submitted with copies of authorizations required from other bodies of government identified in Section III of these regulations.

2. In completing Form CRMC 8-1/74, applicants shall comply with the following standards:

   a. The location of the proposed project shall be drawn on maps of appropriate scale showing the layout and distribution of buildings and other structures, connections with public utilities, sources of water and waste storage and disposal facilities. Such maps and drawings shall further identify planned expansions or modifications of the facility for which separate Council permits would be required at a future date.

   b. Engineering and architectural drawings including both plan views and elevations shall indicate existing topography and drainage patterns, soil and bottom sediment types, marine and terrestrial vegetation and fish and wildlife distribution, hydrology, meteorological characteristics, bathymetry, tidal flows and currents and changes which will occur to these and other physical characteristics of the site as a result of site preparation and facility operation.

   They shall also indicate the distribution of buildings and equipment, roads, water intakes and outfall structures, sewers, stacks; vents and other structures or developments associated with the proposal.

Drawings shall be accompanied by detailed technical descriptions of the functions and operating characteristics of the proposed facility including plant equipment; air and water use, treatment and pollution abatement equipment and techniques; solid waste handling, treatment and disposal equipment and techniques; maintenance schedules and techniques; and other equipment and techniques including those related to safety and emergencies associated with operation.

Detailed descriptions and schedules of equipment and material movement on and off the proposed site; of the sequence, timing and magnitude of construction and site preparation activities; of projected noise levels at various times of the day and season; and of visual aspects of the proposal from offsite vantage points shall also be attached.

The above described drawings and descriptions shall in all instances clearly and separately address facility construction, facility operation, and facility decommissioning.

They shall further address planned expansions or modification of the facility for which separate Council permits would subsequently be required.

3. Applicants shall be required to describe the basis on which they have determined the proposed facility is needed. This description shall at a minimum consist of the following:

   a. A description of the methodology used to analyze and forecast future demands on energy reserves and future supplies of those reserves within the market area to be served by the proposed facility;

   b. An identification and discussion of key variables affecting future demand and supply including specifically such factors as resource depletion, vulnerability to political interdiction, (relative changes in the cost and availability of conventional energy reserves, technologies' impact on use patterns and cost) fluctuations in the

economy of the state and region, changes in national energy policies and priorities, effects of ongoing conservation programs, increased development of renewable and native energy resources;

c. A description of how the forecasting methodology has considered these and other relevant factors and its sensitivity to unanticipated changes in them;

d. A description of those patterns and trends in demand and supply which have been identified including as appropriate those at the international, national, regional, and state levels;

e. An identification of the forecasting time frame including both the length of time over which data have been accumulated and the future time period covered by the forecast;

f. A discussion of the economic costs or benefits that would accrue to the consumer if building the proposed facility were to result in excess supplies of a particular form of energy and a comparable discussion of the relative costs or benefits that would accrue if not building the proposed facility were to result in disruption of supply or service.

4. Applicants shall be required to demonstrate by reliable and probative evidence that they have fully described and adequately considered the full range of impacts associated with the proposed action including both those of a positive and negative nature and further including those affecting the site itself, surrounding resources and areas and, as appropriate, the state and region as a whole. This description and demonstration shall at a minimum consist of a benefit cost analysis of the facility over its entire life cycle including decommissioning; such analysis to address, but not be limited to, a description and consideration of:

a. Environmental impacts including those associated with site preparation, facility construction, operation and decommissioning and the costs of efforts to mitigate these impacts; more particularly:

Impacts related to the discharge of pollutants (as defined in Section 3 of the Coastal Management Program) into the state's air and waters and the disposal of solid wastes;

Impacts related to the generation of noise and visual intrusions;

Impacts related to the withdrawal of cooling and/or process waters from aquifers or surface waters;

Impacts related to physical alteration of the marine or terrestrial environment;

b. Social impacts during all phases of the proposed facility's life cycle including more particularly:

Impacts on broad and long term development patterns including changes in population distribution, industrial and/or urban development;

Impacts on public services such as schools, highways, hospitals, police and fire protection, water and sewer service;

Impacts on housing including availability and residential development patterns;

Impacts on historic, cultural and aesthetic resources;

Impacts on public safety through exposure to increased risk of fire, flood, explosion or environmental contamination whether as a result of normal operations, accidents or sabotage;

Procedures, including emergency procedures, for the safe production, transportation, isolation, storage, containment and/or disposal of materials or wastes hazardous to man must be described;

The Council, however, recognizes that pursuant to the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974, all issues related to radiological health and safety are reserved to the Nuclear Regulatory Commission and the Environmental Protection Agency. Where on the basis of evidence before it, the Council identifies concerns in this area regarding any proposed siting action in Rhode Island, it shall express those concerns through avenues provided it by the above referenced Acts.

c. Economic impacts during all phases of the proposed facility's life cycle including more particularly:

Impacts on the end cost and availability of energy to consumers;

Impacts on employment patterns and levels;

Impacts on retail and wholesale sales and on other sectors of the economy.

d. Where plans exist to expand or modify the proposed facility such that a separate Council permit will be required, the impacts associated with this expansion or modification shall also be considered as required herein as party of any overall benefit/cost analysis.

e. Applicants must identify the means or sources by which they have determined impacts and the methods, assumptions and values they have applied to estimate net benefit/cost.

f. Where information or studies prepared for other agencies of government address any of the requirements of this section the applicant is encouraged to submit same to the Council; provided that the Council in its sole discretion shall determine whether information or studies so submitted are sufficient.

5. Applicants shall further be required to demonstrate by reliable and probative evidence that they have fully described and adequately considered all reasonable alternatives to the proposed action and shall identify the reasons they have been rejected. Such demonstrations and descriptions shall at a minimum include:

a. Identification and description of at least two alternative sites for the proposed facility on maps of appropriate scale.

At least one of these sites shall be located outside the coastal region.

Alternative sites shall be compared in essential characteristics to the site chosen; including particularly those identified pursuant to Section IV-A-2(b) of these regulations.

The specific reasons for rejecting each alternative site in favor of the proposed site must be described. These reasons must include, but need not be limited to, a comparison of projected impacts and benefit/cost ratios as required by Section IV-A(4) of these regulations.

b. Identification and description of all reasonable alternative means to meet the demands that would otherwise be met by the proposed facility.

Such alternatives shall include, but are not limited to, conservation and other techniques or programs to increase the efficiency of energy use or otherwise reduce consumption

and demand and other technologies including small scale, decentralized and renewable source technologies.

Alternatives shall be compared in essential characteristics to the facility proposed and the specific reason for rejecting each in favor of this facility must be described as in (a) above.

B. On the basis of the above required submissions, applicants shall be required to demonstrate to the Council by reliable and probative evidence that the proposed action:

1. Will not conflict with any Council Policies and Regulations regarding use or alteration of the resources of the coastal region as these are set forth elsewhere in the Rhode Island Coastal Management Program;

2. Will not either directly or through its impacts on surrounding development patterns conflict with the State Guide Plan;

3. Is consistent with state and national energy policies and priorities as articulated by the executive or legislative branches of the federal government.

4. Is needed to meet demonstrable future demands for energy both within the state and within the market area for the source in question;

5. Is the best choice from among all reasonable alternatives to meet future demands considering its broad impacts over the entire life cycle of the proposed facility, its security from supply disruptions and its contribution to the development of a diverse, flexible and dependable mix of energy sources.

C. Applicants for shorefront sites shall additionally be required to demonstrate by reliable and probative evidence that the proposed facility has a unique combination of requirements including need for access to navigable waters for purposes of transportation or transfer of materials, or for industrial cooling or processing water and, further, that these requirements cannot be met at another

site or utilizing other technologies because of substantial technological difficulties, environmental or economic penalties.

D. Where on the basis of evidence before it, the Council finds that any of the above required demonstrations have not been satisfactorily made, it shall require appropriate modification of or shall deny the application in question; or in the case of nuclear power plants or oil refineries which are "project plans" of the Economic Development Corporation, it shall forward its recommendations to this effect to the General Assembly.

E. Recipients of Council permits shall be required to maintain such records as may be necessary to monitor and ensure compliance of facility operations with permit conditions and shall further allow designated Council representatives to inspect facilities and records upon reasonable notice.

F. The Council shall review all applications upon submission for completeness. Where any of the information required under IV A, 1-5 inclusive is not provided, the application shall be deemed incomplete and shall be returned to the applicant for completion together with a concise statement of the specific reasons for rejection.

The applicant may petition the Council to initiate review of an incomplete application and the Council may grant such a petition upon finding that deficiencies are of such a minor nature as to permit review of the application to proceed uncompromised. However, if identified deficiencies in the application are not remedied to the Council's satisfaction within thirty days of granting of the above petition, review of the application shall cease forthwith.

The Council shall provide public notice of all findings and determinations regarding the completeness of applications at the time it notifies the applicant.

NOTE TO READERS

Appendix B, "Management Procedures" of the Rhode Island Coastal Management Program sets forth in detail the various

procedural mechanisms governing the provision of public notice of applications before the Coastal Resources Management Council, the scheduling and conduct of public hearings and the availability of records and other material pertinent to applications.

Public notice will be given and hearings scheduled for all facilities subject to the above regulations: Material relevant to applications will be available for public inspection.

240 NATIVE ENERGY RESOURCES

240.0-1 Findings

A. Rhode Island at present makes no significant use of energy resources from within the state's boundaries (see Section 610.0-1). Native energy resources do exist, however, and may become of great significance in the future. (These resources include direct and indirect use of the sun, solid waste, water power, wind, and coal.

B. Solar energy is presently regarded as a potentially important source of energy that could provide a significant proportion of our energy needs.

- The total (direct) solar energy received by the state each year is many times our total annual energy consumption. The problem is that solar energy is diffused and must be concentrated to be usable as an energy source.

- Studies suggest that the most practical uses of solar energy are presently home water heating (for domestic and commercial use) and space heating. These two energy uses presently account for some 40 percent of Rhode Island's total annual energy consumption.

- Current studies indicate that heating water with solar power is presently competitive with electrical water heating.

- The federal government has recently proposed a series of incentives which would encourage the installation of solar water heaters.

- Solar powered home heating by hot water or hot air has been proved feasible. The initial costs of installing such a system are high, but building designs that can take advantage of the sun without special equipment are readily available and life cycle costs are lower than for conventional systems.

C. As the cost of electricity, oil, and gas spiral upwards, more people are using wood stoves to help heat their homes. Highly efficient stoves are readily available and firewood is at present relatively inexpensive.

- About 395,000 acres of Rhode Island is forested. Harvesting only the net annual growth of some 154,000 cords would yield a steady 4.1 trillion BTUs of energy, annually which is 2.4 percent of 1976 total state energy consumption and 5.8 percent of residential/commercial use.

- Technology to burn chipped forest wastes for heating and electrical generation is now in early stages of commercial development.

D. Solid waste, whose disposal is becoming a growing municipal problem, is also a potential energy resource. About 80 percent of typical residential/commercial waste is combustible.

- The 675,000 people living within a 10-mile radius of Providence generate about 1700 tons of solid waste per day.

- The energy value of this waste is 5.6 trillion BTUs annually, which is 3.2 percent of the 1976 residential/commercial consumption.

- The state's Solid Waste Management Corporation is in the proposal review stage for a 1025 ton per day solid waste and sewage sludge handling and energy recovery system to provide all the steam and electric power for the State Institutional Complex in Cranston. It will also provide 30 megawatts of power generating capacity for electricity sale to Narragansett Electric, which could amount to 5.5 percent of the present state electricity consumption. The entire project will cost $55 million and begin operation late in 1981. The combustion residue may be used in road construction.

E. Water powered Rhode Island industries in the last century, but this energy source is presently almost entirely unutilized.

- There were 460 water wheels in operation in 1875 but only 4 in 1972.

- Water was used to power textile mills, saw mills, and grist mills. The Pawcatuck, Pawtuxet, Providence and Blackstone Rivers were the sites for most water powered industries.

- Although the amount of power that can be produced in Rhode Island from water appears relatively small, water power could again be utilized to power some manufacturing plants and residential buildings.

- The total capacity of hydroelectric facilities is 10,000 kilowatts, enough to generate 1.8 percent of Rhode Island's electricity consumption. The Army Corps of Engineers has identified between 100 and 150 sites where existing dams could be retrofitted or new ones built.

F. Wind power may prove to be a significant supplemental source of power in the future, but problems remain to be solved before wind power will be feasible as a significant energy source.

- No thorough analysis has been made of the possibility of utilizing wind power throughout Rhode Island. Providence, however, is one of the windiest cities in the United States with speeds averaging 10.7 mph over a year.

- Small units ranging from 1 to 10 kilowatts are readily available from several manufacturers, suitable for home and experimental use. At present such units may be economical in remote areas where utility connections are expensive.

- The federal government is installing a 200 kilowatt wind machine on Block Island at a cost of $2 million. To avoid television reception interference from such a large installation, project costs include cable television connections for a number of nearby homes. Mass production of such large wind machines would lower costs substantially.

G. As much as 135 million tons of coal is believed to be deposited in Rhode Island, principally under the towns of Portsmouth and Bristol.

- Narragansett Basin coal has a very low sulfur content, making it a potentially desirable in terms of its limited impacts on air quality.

- It is not known how much, if any, of this coal is recoverable by existing or unconventional techniques at acceptable environmental and economic costs.